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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/017,033	12/14/2001	Hichem M'Saad	A6139/T43800	7470
32588	7590	07/26/2004	EXAMINER	
APPLIED MATERIALS, INC. 2881 SCOTT BLVD. M/S 2061 SANTA CLARA, CA 95050			HOFFMANN, JOHN M	
			ART UNIT	PAPER NUMBER

1731

DATE MAILED: 07/26/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/017,033

Applicant(s)

M'SAAD, HICHEM

Examiner

John Hoffmann

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 July 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20,23 and 24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20,23 and 24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1 – 7, 13-15, 18, 20, and 23-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bazylenko 6154582, in view of Faur 6090683, Narita 6122934, Shieh 6204200 and optionally in view of Zhong 6705124.

The basic method is disclosed in Bazylenko at the paragraph spanning cols. 6-7, figure 1A and col. 2, line 56. However, the plurality of cores and the deposition-sputter ratio is not taught. It is noted that it would have been obvious to put multiple cores on the substrate so as to have more pathways for light communication. Duplication of parts is rarely a patentable invention and Applicant has not indicated any evidence of non-obviousness. Furthermore multiple cores is conventional: see Rossman.

Faur is cited as showing it is known in both the silicon based electronic art and the photonic/optoelectronic device art that filling gaps with silicon dioxide is a known problem. Col. 1, lines 6-22, and col. 9, lines 49-65.

Shieh is cited because it shows that it is known that the claimed deposition-sputter ratio is a result effective variable when using HDP silica deposition and discloses a values that are consistent with applicant: see claim 8 of Shieh as well as col. 3, lines 1-57 and figure 6. Ngai is cited as

Zhong is cited optionally as showing that voids between cores is a known problem.

Narita is cited as showing that voids between cores is a known problem.

On the basis of what is known to those in the high density plasma deposition art: it would have been obvious to have the claimed deposition-sputter ratio so as to be able to fill any gap between adjacent cores. Alternatively, it would have been obvious to perform routine experimentation to determine the optimal deposition-sputter ratio.

Claim 2: see col. 2, lines 32-36 of Bazylenko.

Claim 3: col. 6, lines 22-25 of Bazylenko.

Claim 18: see col. 6, line 19 of Bazylenko.

Claim 23: see col. 3, lines 15-22 of Bazylenko.

Claim 24 is clearly met of Bazylenko.

Claim 4: The flow rates are not disclosed. It would have been obvious to have whatever flow rates in as desired – depending upon the scale of the operation/chamber. Clearly a small substrate would require a lower flow rate than a large substrate. Furthermore, it would have been obvious to perform routine experimentation to determine the optimal flow rates.

Claim 5: see col. 7, line 4 of Bazylenko.

Claim 7: see col. 2, lines 34-35, and col. 6, lines 63-67 of Bazylenko : any amount would be obvious based on the scale of the operation, and the degree of doping desired.

Claim 13: based on col. 5, line 49 and col. 6, line 12 of Bazylenko, the power density appears to be only 4 W/cm². It would have been obvious to perform routine experimentation to determine the optimal power, with no new or unexpected results. Furthermore, even if one was felt that they were limited to the disclosed power for the figure 1a of Bazylenko embodiment, such gives no indication as to what the power would be for the ECR (col. 6, line 19) alternative embodiment. It would have been obvious to perform routine experimentation to determine the optimal power for the ECR embodiment.

Claim 14: there is a bias applied: col. 6, lines 13-14. It would have been obvious to perform routine experimentation to determine the optimal bias power.

Claim 15: Bazylenko uses a pressure of 15 millitorr. It would have been obvious to perform routine experimentation to determine the optimal pressure in the ECR apparatus.

Claim 20: col. 6, lines 64-65 of Bazylenko discloses an index of 1.45 which is between 1.46 and 1.4473. 1.46 is "about 1.4443". There is no indication that the 1.45 value is at 1550 nm. If the claim limitations aren't inherently met, it would have been obvious to have what ever index one desires, depending upon the particular optical device/characteristics one desires.

It is noted that at least part of the rejection is based motivation that is not found in the present references. Obviousness can be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some

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teaching, suggestion, or motivation to do so in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). For example, making things portable, integral, separable, adjustable, or automatic are a few obvious modifications that come from knowledge generally available to one of ordinary skill as set forth in well-established case law. The rejection clearly states the complete rationale for the holding that the invention was an obvious one.

Furthermore, if the Office had taken the position that the reference did provide the motivation, the rejection would have been under 35 USC 102 anticipation.

Claim 8 rejected under 35 U.S.C. 103(a) as being unpatentable over Bazylenko 6154582 in view of Faur 6090683, Narita 6122934, Shieh 6204200 and optionally in view of Zhong 6705124 as applied to claim 7 above, and further in view of Ngai 6451686.

In the HDP deposition art, SiF₄ and CF₄ are known equivalents for fluorine sources for : col 13, lines 46-54 and col. 12, lines 33-37 (Ngai). IT would have been obvious to substitute equivalents in the Bazylenko method, depending upon which gases are most available.

Claims 9-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bazylenko 6154582 in view of Faur 6090683, Narita 6122934, Shieh 6204200 and

optionally in view of Zhong 6705124 as applied to claim 2 above, and further in view of Imoto 4856859 .

Bazylenko does not disclose using phosphorous gas as claimed. Imoto discloses that one can dope cladding using the claimed gas: col. 4, lines 61-66 and col. 2, lines 20-28. It would have been obvious to include the claim gas depending upon what specific glass is desired and what particular properties one desires for the final product. The particular flow rates would have been obvious depending upon the desired degree of doping, and the size of the substrate to be made.

For claim 11 – it would be obvious to include boron as claimed – if one desires the known properties that boron produces in the final product.

Zhong is cited as being an “optional” because it is not necessary to demonstrate the invention is obvious (in the event that Applicant swears behind the Zhong filing date.) However Zhong does show that it is known to use HPD to make conformal layers with glass that includes boron and phosphorous.

Claims 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bazylenko 6154582 in view of Faur 6090683, Narita 6122934, Shieh 6204200 and Imoto 4856859 (and optionally in view of Zhong 6705124) as applied to claim 11 above, and further in view of Schneider 4557561.

The boron trifluoride is not taught. Col. 3, lines 29-40 of Schneider discloses using the boron trifluoride when making a glass: to 1) add fluoride, and 2) to add the

boron as a dopant. It would have been obvious to use boron Trifluoride in the Bazylenko process so as to supply another dopant Boron, and to help incorporate fluorine into the glass – depending upon the desired optical/chemical properties the artisan wishes to have in the final product.

Claims 13-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bazylenko 6154582 in view of Faur 6090683, Narita 6122934, Shieh 6204200 as applied to claims 1-2 above and further in view of Rossman 6194038 and optionally in view of Zhong.

Bazylenko discloses different operating parameters than is being claimed. However, Rossman recognizes that the same claimed operating parameters “greatly increases the deposition rate” (col. 2, lines 29-34) – among other advantages. See col. 3, lines 8-37 of Rossman which discloses the various parameters. Col. 2 lines 9-21 discloses that the process is of the same nature as applicants’ and Bazylenko’s. It would have been obvious to change the Bazlenko parameters/gases to be in line with the Rossman parameters/gases for any or all of the Rossman advantages.

Claims 17 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bazylenko 6154582 in view of Faur 6090683, Narita 6122934, Shieh 6204200 as applied to claims 1-2 above and further in view of Rossman 6194038 and/or Narita 6122934 (and optionally in view of Zhong 6705124).

See how Rossman is treated above. Narita discloses the same problem that Applicant and Rossman notes: a gap between two close structures. Bazylenko does not disclose this problem. It would have been obvious to have as many cores/waveguides on the substrate as possible, so as to have a high a circuit density as possible. It would have been obvious to use the Rossman method of etching between gaps so as to create conformal layers, and for the high deposition rate. It would have been further obvious to add an additional layer so as to protect the optical device as disclosed in the Narita Abstract.

Zhong is cited as being an "optional" because it is not necessary to demonstrate the invention is obvious (in the event that Applicant swears behind the Zhong filing date.) However Zhong does show that it is known to use HPD to make conformal layers with glass that includes boron and phosphorous.

Response to Arguments

Applicant's arguments filed 7/02/04 have been fully considered but they are not persuasive.

It is argued that Bazylenko does not disclose any aspect of HDP being better than the low-density plasma process that is also disclosed by Bazylenko. The relevance of this is not understood by Examiner. Bazylenko teaches the use of HDP: nothing more than this is required. However, even if the issue is relevant, col. 2, lines 55-56 indicates HDP is a preferred embodiment. Most importantly, the passage that Applicant refers to (col. 6, line 15-20) indicates "other" HDP sources can be used. This

suggests that Bazylenko is only interested in HDP – the “preferred” type as well as the “other” types.

It is also argued that Narita’s solution to the problem is different from the Bazylenko solution – and that it is contrary to the Bazylenko solution. This is immaterial. The rejection is not based on a combination of the references as Applicant suggests. A plain reading of the rejection indicates that Narita is merely evidence that Applicant was not the first discoverer of the problem. Since Examiner cannot merely allege that the gap-problem is known, there needs to be evidence that such was already known. Narita is such evidence. There is no indication in the rejection that the Narita method would be combined with the Bazylenko method.

It is further argued that Rossman is not concerned with optical applications – rather Rossman is directed to electrical devices. This is not convincing because Bazylenko and Rossman are both directed to HDP deposition of silicon dioxide. One of ordinary skill in the HDP art would recognize that Rossman’s discovery of “greatly increasing the deposition rate” can be applied to all HDP methods.

As to the size of the features in the electronics art versus the size in the optical device art: if anything that would **increase** the motivation to combine. Since Rossman has sizes an order of size smaller than Bazylenko (as argued by applicant) – one would derive even more benefit for “greatly increasing” the deposition rate. For example, if one can increase the rate for creating the Rossman electronic device, say from 10 minutes to 5 minutes. Then the corresponding time increase for something 10 times as large would be from 100 minutes to 50 minutes: a savings of 50 minutes! This would be

10 times better than a savings of 5 minutes. It is noted that a change in size is generally not a patentable invention.

It is further argued that Rossman teaches a ration of 2.4:1 – 2.6:1 at col. 20. First Rossman doesn't have a column 20. Second, Examiner could not find anything that supports this determination: A detailed explanation is required. At most col. 2, line 54 refers to an aspect ratio of 2.5:1: but there is no relation between that Rossman ratio and the a deposition-to-etch ratio Applicant argues (or if it is, Applicant needs to explain how it is.) Third, as indicated in the present rejection: the claimed ratio is a result effective variable and it would have been obvious to perform routine experimentation to determine the optimal value. Alternatively, the prior art discloses Applicant's ratio.

Lastly it is argued that Bazylenko does not recognize simultaneous deposition and sputtering that is a hallmark of HDP. Since it is the hallmark, there is no point in Bazylenko discussing it: patent applications generally do not include that which is already well known. Further – the other references disclose such processing is known and that Applicant's gap-filling discovery was already known to those in the HDP art.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John Hoffmann whose telephone number is (571) 272 1191. The examiner can normally be reached on Monday through Friday, 7:00- 3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steve Griffin can be reached on 571-272-1189. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


John Hoffmann

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Primary Examiner
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jmh